

Technology in Education

Table of Contents

1 Trends

- 1 Engaged Learning for Today's "Digital Natives"
- 1 Education revolution
- 2 A look at yesterday and today
- 2 The communication revolution
- 3 Engaging a Generation of "Digital Natives"
- 3 Strategy**
- 3 Paths to Successful Education
- 4 Addressing Educator and Student Expectations
- 4 Right Training, Right Access
- 5 Technology as a part of life
- 5 Visual, hands-on learning
- 6 Delivering a customized learning experience
- 6 Engaging students in collaborative learning solutions
- 6 Building success on best-in-class solutions
- 7 Dramatic changes underway

Trends

Engaged Learning for Today's "Digital Natives"

Preparing students for lifelong learning requires new approaches to education that incorporate technologies increasingly a part of students' everyday lives. While the importance of reading, writing, and arithmetic still holds true, educators need to look at these and other subjects in new ways, using readily accessible technologies to engage and inspire students to take a more active role in learning.

It's accepted that a well-rounded education is a gateway to personal success. It sets students on a path to lifelong learning that enables them to succeed in a changing world. Through education, individuals can expand their minds and embrace new ideas and opportunities, and at the same time, build better lives for themselves and their communities. In a world where geographic boundaries are blurring, students also need the flexibility to connect with and collaborate with people anywhere at any time—communicating information in more dynamic, engaging ways.

In addition, it is necessary to consider the impact education plays in competitive economies, where once local industries now compete on a global scale. For today's students to become tomorrow's leaders in science, technology, healthcare, the arts, and other areas, they need to know how to use all the tools at their disposal.

In a recent report, the Partnership for 21st Century Skills highlighted many of the challenges and opportunities facing students and educators in the United States.

“In an economy driven by innovation and knowledge...in marketplaces engaged in intense competition and constant renewal...in a world of tremendous opportunities and risks...in a society facing complex business, political, scientific, technological, health, and environmental challenges...and in diverse workplaces and communities that hinge on collaborative relationships and social networking...the ingenuity, agility and skills of the American people are critical to U.S. competitiveness.”¹

Education revolution

As the technology for personal and business use evolves, so do the tools available to teachers to enhance student learning. By looking at changes in technology as an opportunity to advance student learning—particularly when a technology is already widely adopted by students—educators can better engage students and give them a strong foundation for continued learning.

¹ Partnership for 21st Century Skills. 21st Century Skills Education and Competitiveness Guide (2008).

In a sense, the education revolution driven by technology is at once old and new. Technology offers educators the opportunity to revisit old challenges with new tools. Instead of simply viewing technology as a skill set that students need to learn, it can be used to transform curricula to provide students with learning that is at once more relevant and customized to their unique learning styles.

The impact of more customized and personalized approaches to teaching can be far reaching. A 2008 article in *Education Week* focused on effective teaching in the United States by examining different learning styles and explaining that customized learning approaches are needed to help students succeed. As the article highlights:

“...all students learn differently. Most of us know this intuitively. We learn best through different methods, with different styles....some learn better through visual means; others need to talk it through, write it down, play it out, and so on.”²

A look at yesterday and today

The current education system in modernized countries dates back to the Industrial Revolution, when agricultural workers needed to be prepared for factory jobs. But in today’s age of instant information, the Industrial Revolution is a distant memory, as are most jobs involving assembly lines and machine work. Former strategies that involved teaching by rote and following rigid academic agendas no longer engage the majority of students and do little to prepare students to compete in an agile, global economy.

The shift in skill sets required to prepare students for success is occurring at an accelerated pace. In less than three decades, developed countries have moved from manufacturing economies to knowledge economies that require unprecedented analytical and interactive skills. In just one generation, skill requirements have changed dramatically, and today’s employers are demanding workers who can think and work differently from their parents.

To strengthen student success in school and beyond, students need to become effective communicators who can understand, manage, and create exceptional written and multimedia communication in a variety of forms and contexts. They also need to be able to think critically, exhibit sound problem solving skills, and know how to frame and synthesize what they’ve learned. Technology literacy and the ability to access, manage, analyze, integrate, evaluate, and create information in a variety of forms and media are essential. Students need to know more than just how to use technology—they must be able to engage with technology to gather knowledge and use it to communicate, collaborate, and innovate.

The communication revolution

Part of what is driving the need for new types of skills is an enormous shift in how people access information and communicate. With the advent of the Internet, information has gone from scarce to abundant, and it can be accessed using many different devices, from computers and phones to PDAs.

At the same time, new communication avenues are everywhere, from blogs and social networks to web conferences that connect anyone, anywhere, anytime. Instead of waiting for the daily paper to hit the front porch, there has been a democratization of publishing. Already, many students participate in the publishing process by writing in these channels, viewing themselves as content creators who share their opinions, stories, music, and videos—all with the aim of expressing their creativity and exchanging information.

As a result, new forms of media, such as blogging, instant messaging, and social networking are redefining what it means to be connected, shaping the way people interact, how they make and maintain friends, network with colleagues, and live their lives.

A 2007 survey conducted for the National School Boards Association focused on “social networking” and involved 1,309 teens and tweens ages 9 to 17 years; more than 1,000 parents; and 250 school district leaders.

² Christensen, C.M., Horn, M.B. and Johnson, C.W. (2008). How ‘Disruptive Innovation’ Will Change The Way We Learn. *Education Week*, 27(39): 36-25.

“96% of responding students said that they network socially using various online communities...Students report that they are engaging in highly creative activities on social networking internet sites including writing, art, and contributing to collaborative online projects whether or not these activities are related to schoolwork. Also 96% of school districts report using the Internet and other technologies for educational purposes including online collaborative projects.”³

Engaging a Generation of “Digital Natives”

Today’s students are the most wired generation yet. According to eMarketer, 95% of U.S. college students will use the Internet at least once a month. Their time spent online is measured in hours per day—not per week. On many campuses, more than 80% of students use social networking sites on a regular basis.

International education consultant and author Marc Prensky refers to students who have been immersed in technology since birth as “digital natives”. To digital natives, technology is not a tool; instead, it is a fundamental part of the way they live. They rely on the web for information, communication, entertainment, and to connect with the world around them, regardless of the distance between communities. This is evident in several areas, including the rapid adoption of social networking.

The key in engaging the digital generation is for educators to apply the right technology at the right time. Using technology advances, teachers can present lessons in ways best suited to the cognitive styles of their students. For example, the use of video, audio, and text can mutually reinforce concepts and enable students to engage the same ideas in multiple ways. However, accomplishing this means that educators must view technology not as “the enemy” but as a key tool to motivate and engage students. By addressing students at this level, schools can overcome problems with “emotional truancy,” where students show up for class but essentially tune out the lesson.

In a National Science Foundation (NSF) report developed by the NSF Taskforce on Cyberlearning, the impact that technology advances are having and will have on education can be profound. While the NSF report uses the term “cyberlearning—the use of networked computing and communications technologies to support learning”, the opportunity for educators and lifelong learners is evident, regardless of the terminology used.

“Cyberlearning has the potential to transform education throughout a lifetime, enabling customized interaction with diverse learning materials on any topic—from anthropology to biochemistry to civil engineering to zoology. Learning does not stop with K-12 or higher education; cyberlearning supports continuous education at any age.”⁴

Strategy

Paths to Successful Education

Because teachers are typically not digital natives, the key to success isn’t to simply add technology to the classroom. Instead, the focus needs to be on enabling teachers to integrate the tools into their curricula, so they are comfortable letting their students use them. Adobe believes that both K-12 and higher education will evolve along four paths to help ensure that current and future generations are engaged in the classroom and have developed the proper skills to succeed in the global economy.

- Customized: Educational institutions will need to offer personalized instruction to accommodate different learning styles and tailor courses and services to meet the individual needs of students, faculty, and staff.
- Collaborative: The level of collaboration between students and faculty will continue to grow, and faculty will increasingly become facilitators who help co-create knowledge. Students and faculty will work in face-to-face and virtual teams worldwide to tackle complex and sophisticated projects, and bring together different perspectives and skills.

³ Grunwald Associates. (2007). *Creating and connecting: Research and guidelines on online social—and educational—networking*. Alexandria, VA: The National School Boards Association.

⁴ NSF Taskforce on Cyberlearning. *Fostering Learning in the Networked World: The Cyberlearning Opportunity and Challenge*. (June 2008)

- Creative: By integrating the technology that students use, admire, and aspire to, education institutions will appeal to digital natives, driving innovation and enthusiasm and setting students on a path to success.
- Distributed: Students will increasingly be attending institutions virtually, making knowledge more accessible and available to a greater number of people.

Adobe® solutions already help educators and students succeed in all four areas. Adobe virtual classroom solutions enable learning anywhere, anytime, on any device, and extend the reach of the classroom to teach, learn, and collaborate in real-time. Schools can also customize the learning experience to meet the needs of individuals, while seamlessly fitting into the existing infrastructure of the institution.

Addressing Educator and Student Expectations

The impact Adobe solutions are having on educators and students is evident worldwide. At Purdue University, technology is being leveraged to enhance student learning with more dynamic online content and expanded opportunities for real-time collaboration. “There’s tremendous demand from faculty, administrators, and students to use the web to deliver real-time lectures, participate in project meetings, and organize virtual study teams,” explained Bart Collins, former director of the Instructional Development Center (IDC) at Purdue.

For Purdue, Adobe Acrobat® Connect™ Pro was a perfect fit for the university’s short- and longer-term goals. Faculty and students alike were immediately impressed by the Adobe software because it was so easy to use and could adapt quickly to a range of online meeting and collaboration applications. Today, Acrobat Connect Pro meetings are available to more than 40,000 students and 17,000 faculty.

The Adobe software provides students with the ability to meet and share information via the web with peers and professors for enhanced learning. School administrators benefit from the intuitive Adobe software because they can spend less time traveling across campuses for meetings. Equally important, faculty can deliver engaging course content online and teach classes remotely, if necessary.

For example, Professor Jian Wang used Adobe Acrobat Connect Professional to solve a scheduling problem. During a two-week research trip to Beijing, he delivered two synchronous online lectures to students in his integrated marketing class on Purdue’s main campus in West Lafayette, Indiana. The students attended class at their usual time, while Wang delivered his lectures from a small office in China.

Because the students and Professor Wang had access to web cameras and audio and video feedback, they could interact with each other in real time. “Acrobat Connect made distance irrelevant,” said Wang of his Beijing experience. In fact, the next time Wang teaches a global marketing class, he plans to use Acrobat Connect Pro to enable Purdue students in the United States to collaborate with university students in China.

Right Training, Right Access

The Florida Center for Instructional Technology (FCIT), based in Tampa, has been a leader in working with educators to integrate technology into the curriculum. FCIT assists more than 1,200 pre-service teachers who graduate from USF each year as well as thousands of the state’s in-service teachers.

Time and distance in the past were constant obstacles. Now, all school districts remain on equal footing with central districts by participating in web-based synchronous training programs using Acrobat Connect Pro software. Using Adobe solutions, FCIT created a mentor-based, peer-to-peer instructional development program. Teachers and students have become energized to embrace web-based learning. Both remote and central school districts are reached using distributed technologies. And the district saves substantially on time and travel.

Technology as a part of life

Educators can use Adobe solutions to visualize and explain difficult concepts, bring learning to life and appeal to a wide range of learners. By providing creative solutions that students are already actively engaged in, Adobe enables educators to teach students within the context in which they live. This helps to motivate and engage students in the classroom, promotes creativity, and instills a broad range of digital communication skills critical for future success in virtually any career.

At the world-renowned Wharton School of the University of Pennsylvania, the school's rich history of education is being enhanced with the latest 21st century tools. The use of advanced technology is everywhere at Wharton. For instance, finance students get firsthand experience on the vagaries of the stock market through a dynamic trading simulation that enables students to manage their own virtual stock portfolios and track success against their peers. Gains and losses are measured in real-time, while both students and instructors review and share comments in the simulation.

And for students at schools like the University of Pennsylvania, this is just the beginning. Simulations in biology, engineering, and other disciplines transform pen-on-paper exercises into engaging, high-impact lessons. Even routine functions—such as interactive seating charts, digital office hours, and group study sessions—are being redefined by technology. The enthusiastic response from students to the applications is a direct result of their comfort using a wide range of technologies, as well as to the clear benefits that the digital tools deliver.

Visual, hands-on learning

The increased use of simulations and multimedia tools underscores a shift in education to bring technology outside of traditional computer, design, and video courses. For instance, students in Language Arts classes at Crestwood Junior and Senior High Schools in Iowa are using multimedia software to illustrate scenes that give them a deeper understanding of plots and characters in classic literature.

It is no secret that students today are exposed to more images than ever, whether through television, the Internet, movies, or games. By teaching students to interpret stories and create their own images using Adobe software, they become more than just passive consumers of other people's and are better able to express themselves visually and convey relationships and meaning.

With so much to do in today's busy world, teaching students to become engaged participants, and not just passive observers, is a formidable challenge. Adobe software has been instrumental in the move to more visual, hands-on learning. At Coral Reef High School, a mega-magnet school in Miami with more than 2,700 students and a top-ranked school in the United States for academics, teachers are tapping into the power of Adobe Creative Suite® 3 to help students find their own unique creative expressions in the arts, sciences, and mathematics. The results are phenomenal, with students—some who never considered themselves technology savvy or very creative—earning national recognition for their work and discovering new talents.

Colette Stemple runs the Digital and Still Photography program at Coral Reef High School, and her class on Adobe Photoshop® CS3 is one of the school's most popular classes—and one that several students credit with renewing their commitment to learning and inspiring them to improve their grades overall. Stemple notes that Adobe software provides a bridge to reach students who otherwise might give up on certain subjects, adding that students can use Adobe software to explore a subject at their own pace.

Says Stemple, "I have seen students who could not draw a straight line on paper achieve the highest AP scores in their drawing exams after working in Photoshop and drawing with the Wacom tablets. In Physics, students who had problems understanding abstract concepts like electrical energy suddenly got the picture and raised their grades after illustrating concepts in Photoshop. The Adobe tools help open doors for students that they never dreamed they could enter."

Delivering a customized learning experience

Adobe technologies enable educators to provide customized, engaging learning experiences that appeal to a wide variety of learners. By personalizing the science curriculum, students at Eagan High School in Minnesota have become highly engaged and motivated in a difficult-to-master area of study. Eagan has integrated technology across the curriculum, enabling high school chemistry students to create their own learning materials by programming web-based interactive simulations using Adobe Flash® CS3 Professional. With this individualized approach, the classroom and lab emerge as interactive forums, where students better understand the dynamics of the phenomena they are studying. Students also learn valuable, real-world programming skills and are often inspired to further explore scientific concepts.

At Bellarmine Preparatory High School in San Jose, California, educators introduced multimedia courses into the curriculum to develop and promote important communication and collaboration skills and prepare students for college and future careers.

Whether they are designing a logo, developing a professional-looking website, directing a short film, or drawing a 3D model, Bellarmine students are actively engaged in exploring college and career choices using Adobe Creative Suite 3 Master Collection software. The school is supporting the creative process and building critical skills by giving students access to industry-leading creative tools. Students have the added bonus of creating professional-level portfolios to showcase their work to colleges or potential employers.

Engaging students in collaborative learning solutions

Adobe solutions excel at fostering collaborative education. As Canada's largest province, Ontario's population exceeds 12 million and is spread out over a large physical area. The Ministry of Education oversees 72 different school boards and many school authorities serving over two million students in more than 5,000 elementary and secondary schools, including more than 115,000 teachers.

The ministry standardized on Adobe Acrobat Connect Pro, Adobe Presenter, and Adobe Captivate® to deliver content and information via highly engaging online experiences. The online model is blended with more traditional learning models and technology is integrated across the curriculum. The results have been impressive. Students are engaged in an intuitive collaborative learning environment that includes gaining access to outside speakers and reality-based learning experiences. Teachers report increased job satisfaction and enthusiasm about their professional development, while students have more direct access to teachers for test preparation, discussion groups, and remedial lessons.

Building success on best-in-class solutions

At the Rochester Institute of Technology (RIT), academic leadership reigns. Over 16,000 students take advantage of RIT's internationally recognized computing, engineering, imaging, technology, and arts programs. Adobe technology plays a key role in keeping RIT at the forefront of design education, particularly in the School of Design, where Adobe products are woven throughout the curriculum. RIT chooses Adobe products because they are the industry standard, cross-platform, cost-effective, and versatile. "With Adobe Creative Suite 3 Design Premium, there is nothing students can't do; they have an unparalleled creative arsenal," says Therese Hannigan, associate professor in the College of Imaging Arts and Sciences. "Adobe products drive achievement in design education at all levels."

Each student at RIT has the opportunity to make an impact on the future of form and function. Using a full complement of Adobe software during their academic tenure and beyond, RIT students approach their work with an eye toward balancing technology with theory in specialties ranging from graphics to industrial design.

Moving from Graphic Design to New Media to Web courses, Adobe software is integral every step of the way. Students learn to create content from print and digital delivery, and the best strategies for reaching their intended audience with compelling content anytime, anyplace.

“Adobe products have been the tools of choice in the RIT design programs for a long time. We’re continually excited about weaving new Adobe technology into the curriculum as it evolves,” says Hannigan. “That’s our assurance that our students will make valuable contributions to the rapidly-changing world of design.”

Dramatic changes underway

As both learning opportunities and the nature of work change, education must change along with them. With the dramatic shift in the skills required in today’s workforce, educators are looking for ways to deliver customized, distributed, collaborative, and creative learning environments that turn passive learners into active participants, ignite innovation, and make education more compelling, personalized, and accessible.

Adobe is committed to helping educators teach students within the technology-rich context in which students live and to enabling teachers to bring learning to life by helping students visualize difficult concepts. Adobe is also dedicated to enabling learning anywhere, anytime, and on any device and providing tools to promote real-time and ad hoc collaboration among students and faculty.

Adobe has been a long-term supporter of education in communities. One of its recent philanthropic charters, Adobe Youth Voices, focuses specifically on creativity in education, helping children learn to think creatively, communicate effectively, and work collaboratively—all critical skills for the world’s next generation of business and community leaders.

Through engaged learning—accomplished using key technologies—educators are unlocking the creativity and enthusiasm of today’s digital natives. How students perform after graduation largely depends on what they learn in school. Students who master on-the-job behaviors alongside digital communications skills not only get the most out of learning, but they also emerge ready for success in today’s world. Given this dynamic, a powerful symbiosis is evident: schools become more relevant to students as they align with the work world. And professional work experience and success reinforce the importance of interactive education that includes multimedia tools like Adobe solutions.



Adobe

Adobe Systems Incorporated
345 Park Avenue
San Jose, CA 95110-2704
USA
www.adobe.com

Adobe, the Adobe logo, Acrobat, Acrobat Connect, Captivate, Creative Suit, Flash, and Photoshop are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries. All other trademarks are the property of their respective owners.

© 2009 Adobe Systems Incorporated. All rights reserved. Printed in the USA.
03/09